

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES



In re Application of:
MAX FRIEDHEIM

OPENING BRIEF RE APPEAL

EXAMINER: S.Y. PAIK

Application No.: ~~10/613,539~~ 10/066,281

Filing Date: 4/30/2001

Art Unit: 3742

FOR: SUPERHEATED VAPOR
GENERATOR SYSTEM AND METHOD

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REAL PARTY IN INTEREST

The real party in interest is inventor Max Friedheim.

RELATED APPEALS AND INTERFERENCES: NONE

STATUS OF CLAIMS

Claim 1. (Under Final Rejection and Appeal). An improved vapor generator and control system comprising:

- (1) a vaporization chamber for generating superheated vapor substantially instantaneously from liquid upon its entry therein, said vaporization chamber defining at least one input for input therethrough of liquid for vaporization in said vaporization chamber;
- (2) liquid supply means connectible to said vaporization chamber for supplying liquid thereto through said input; and
- (3) adjustable control means for adjustably controlling ongoing input of liquid from said liquid supply means during ongoing input of said liquid from said liquid supply means into said vaporization chamber, adjustment of liquid input by said adjustable control means being substantially simultaneously reflected in adjustment of output of superheated vapor, whereby output of superheated vapor is highly precisely adjustably controllable while said system is in operation.

Claim 2. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said adjustable control means adjustably controls volume of liquid input into said vaporization chamber and thereby adjustably controls volume of output of superheated vapor from said vaporization chamber.

Claim 3. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 further including at least one output port for output therethrough of superheated vapor from said vaporization chamber, said at least one output port including means connectable to output control means for controlling output from said vaporization chamber.

Claim 4. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said adjustable control means for adjustably controlling input of liquid into said vaporization chamber adjustably controls pressure of liquid input into said vaporization chamber and thereby adjustably controls pressure of output from said vaporization chamber.

- Claim 5. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means controls volume of output from said vaporization chamber.
- Claim 6. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means comprises at least one valve member.
- Claim 7. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means includes means for directing in a selected direction superheated vapor from said vaporization chamber.
- Claim 8. (Under Final Rejection and Appeal). The invention as set forth in Claim 7 wherein said output control means comprises at least one valve member.
- Claim 9. (Under Final Rejection and Appeal). The invention as set forth in Claim 7 wherein said output control means is adjustable for directing superheated vapor from said vaporizing chamber in a plurality of selected directions.
- Claim 10. (Under Final Rejection and Appeal). The invention as set forth in Claim 8 wherein said at least one valve member comprises a plurality of valve members at least two of which are adjustable to direct output superheated vapor in substantially perpendicular directions.
- Claim 11. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output port is connectable to at least one object to which superheated vapor is to be directed.
- Claim 12. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means is connectable to at least one object to which superheated vapor is to be directed.
- Claim 13. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which is rough.

Claim 14. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which defines at least one groove.

Claim 15. (Under Final Rejection and Appeal). The invention as set forth in Claim 14 further including at least one groove other than the first-mentioned groove and wherein said first-mentioned groove and said second-mentioned groove intersect.

Claim 16. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which defines a plurality of grooves.

Claim 17. (Under Final Rejection and Appeal). The invention as set forth in Claim 16 wherein said plurality of grooves vary substantially randomly in depth in a range substantially .030 inch to .050 inch.

Claim 18. (Under Final Rejection and Appeal). The invention as set forth in Claim 4 wherein said output control means is configured to be hand-held by an operator and to be controlled by said operator.

Claim 19. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which includes at least one perforation.

Claim 20. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which includes at least one irregularity.

Claim 21. (Under Final Rejection and Appeal). A method of fabricating a superheated vapor generator and control system comprising the steps of:

- (a) providing at least two separate parts of a vapor generator;
- (b) fastening said parts together to form a superheated vapor generator defining a vaporization chamber, with at least one input thereto, said superheated vapor

- generator having capability for substantially instantaneous vaporization of liquid upon entry thereof into said vaporization chamber;
- (c) providing liquid supply means connectible to said input of said vaporization chamber for supplying liquid thereto; and;
 - (d) providing adjustable control means for adjustably controlling ongoing input of liquid into said vaporization chamber during said ongoing input of liquid, adjustment of liquid input by said adjustable control means being substantially simultaneously reflected in adjustment of output of superheated vapor thereby providing the capability of highly precisely adjustably controlling output of superheated vapor from said vaporization chamber without requiring said system to cease operation.

Claim 22. (Under Final Rejection and Appeal). The method as set forth in Claim 21 further including the step of providing control means at the output of said vapor generator.

Claim 23. (Under Final Rejection and Appeal). The method as set forth in Claim 21 further including the step of defining at least one groove in at least a portion of an inner surface of at least one of said ports.

Claim 24. (Under Final Rejection and Appeal). The invention as set forth in Claim 21 further including the step of defining a plurality of grooves in at least a portion of an inner surface of at least one of said ports, such that said grooves vary in depth substantially randomly in height and depth in the range of .030 inch to .050 inch.

Claim 25. (Under Final Rejection and Appeal). The invention as set forth in Claim 22 wherein said output control means are adjustable to control the direction of superheated vapor from said vaporization chamber.

Claim 26. (Under Final Rejection and Appeal). A method for cleaning selected objects comprising the steps of:

- (a) generating superheated vapor by substantially simultaneously vaporizing liquid into superheated vapor through subjecting said liquid to superheating; and
- (b) providing capability of adjustably controlling volume, pressure or velocity on line of output superheated vapor for a selected object to be cleaned by

adjustably controlling in an ongoing manner volume, pressure or velocity of said liquid upon being subjected to said superheating, wherein said output is substantially instantaneously adjustable upon adjustment of said input thereby providing highly precise control of output of superheated vapor.

Claim 27. (Under Final Rejection and Appeal). A method for propulsion comprising the steps of:

- (a) generating superheated vapor by substantially instantaneously vaporizing liquid into superheated vapor through subjecting said liquid to superheating; and providing the capability of highly precise control of output of superheated vapor substantially continuously to provide propulsion, by adjustable control of volume, pressure or velocity of said liquid, upon being subjected to said superheating, adjustment of said adjustable control being substantially simultaneously reflected in said output of superheated vapor.

STATUS OF AMENDMENTS:

An Amendment After Final was filed and was entered by the Examiner on April 24, 2008.

SUMMARY OF CLAIMED SUBJECT MATTER

Claim 1. (Under final rejection and appeal). This claim involves an improved vapor generator and control system (Ref. No. 10, Fig. 1, Specification page 4, lines 1-3) comprising:

- (1) a vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) for generating superheated vapor substantially instantaneously from liquid upon its entry therein, said vaporization chamber defining at least one input (Ref. No. 106, Fig. 2, Specification p. 6, lines 8-9) for input therethrough of liquid for vaporization in said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22);
- (2) liquid supply means (Ref. No. 40, Fig. 1, Specification p. 4, lines 23-23) connectible to said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) for supplying liquid thereto through said input (Ref. No. 106, Fig. 2, Specification p. 6, lines 8-9); and
- (3) adjustable control means (Ref. No. 41, Fig. 1, Specification p. 4-5, lines 23-26, lines 1-3) for adjustably controlling ongoing input of liquid from said liquid supply means (Ref. No. 40, Fig. 1, Specification p. 4, lines 23-23) during ongoing input of said liquid from said liquid supply means (Ref. No. 40, Fig. 1, Specification p. 4, lines 23-23) into said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22), adjustment of liquid input by said adjustable control means (Ref. No. 41, Fig. 1, Specification p. 4-5, lines 23-26, lines 1-3) being substantially simultaneously reflected in adjustment of output of superheated vapor, whereby output of superheated vapor is highly precisely adjustably controllable while said system (Ref. No. 10, Fig. 1, Specification p. 4, lines 1-3) is in operation.

Claim 2. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said adjustable control means (Ref. No. 41, Fig. 1, Specification p. 4-5, lines 23-26, lines 1-3) adjustably controls volume of liquid input into said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) and thereby adjustably controls volume of output of superheated vapor from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22).

Claim 3. (Under final rejection and appeal). The invention as set forth in Claim 1 further including at least one output port (Ref. No. 52, Fig. 4, Specification p. 5, lines 7-10) for output therethrough of superheated vapor from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22), said at least one output port (Ref. No. 52, Fig. 4, Specification p. 5, lines 7-10) including means connectable to output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) for controlling output from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22).

Claim 4. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said adjustable control means for adjustably controlling input of liquid into said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) adjustably controls pressure of liquid input into said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) and thereby adjustably controls pressure of output from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22).

Claim 5. (Under final rejection and appeal). The invention as set forth in Claim 3 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) controls volume of output from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22).

Claim 6. (Under final rejection and appeal). The invention as set forth in Claim 3 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) comprises at least one valve member (Ref. No. 63, Fig. 1, Specification p. 5, lines 13-15) (Ref. No. 63, Fig. 1, Specification p. 5, lines 13-15).

Claim 7. (Under final rejection and appeal). The invention as set forth in Claim 3 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) includes means (Ref. No. 56, Fig. 1, p. 5, Specification lines 8-12) for directing in a selected direction superheated vapor from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22).

Claim 8. (Under final rejection and appeal). The invention as set forth in Claim 7 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) comprises at least one valve member (Ref. No. 63, Fig. 1, Specification p. 5, lines 13-15) (Ref. No. 63, Fig. 1, Specification p. 5, lines 13-15).

Claim 9. (Under final rejection and appeal). The invention as set forth in Claim 7 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) is adjustable for directing superheated vapor from said vaporizing chamber in a plurality of selected directions.

Claim 10. (Under final rejection and appeal). The invention as set forth in Claim 8 wherein said at least one valve member (Ref. No. 63, Fig. 1, Specification p. 5, lines 13-15) comprises a plurality of valve member (Ref. No. 63, Fig. 1, Specification p. 5, lines 13-15) s at least two of which are adjustable to direct output superheated vapor in substantially perpendicular directions.

Claim 11. (Under final rejection and appeal). The invention as set forth in Claim 3 wherein said output port (Ref. No. 52, Fig. 4, Specification p. 5, lines 7-10) is connectable to at least one object to which superheated vapor is to be directed.

Claim 12. (Under final rejection and appeal). The invention as set forth in Claim 3 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) is connectable to at least one object to which superheated vapor is to be directed.

Claim 13. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) has at least a portion of an inner surface which is rough.

Claim 14. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) has at least a portion of an inner surface which defines at least one groove.

Claim 15. (Under final rejection and appeal). The invention as set forth in Claim 14 further including at least one groove other than the first-mentioned groove and wherein said first-mentioned groove and said second-mentioned groove intersect.

Claim 16. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) has at least a portion of an inner surface which defines a plurality of grooves.

Claim 17. (Under final rejection and appeal). The invention as set forth in Claim 16 wherein said plurality of grooves vary substantially randomly in depth in a range substantially .030 inch to .050 inch.

Claim 18. (Under final rejection and appeal). The invention as set forth in Claim 4 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) is configured to be hand-held by an operator and to be controlled by said operator.

Claim 19. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) has at least a portion of an inner surface which includes at least one perforation.

Claim 20. (Under final rejection and appeal). The invention as set forth in Claim 1 wherein said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) has at least a portion of an inner surface which includes at least one irregularity.

Claim 21. (Under final rejection and appeal). This claim involves a method (Fig. 6, Specification p. 14, lines 18-20) of fabricating a superheated vapor generator and control system comprising the steps of:

- (a) providing at least two separate parts (Fig. 6, Specification 14, lines 20-24) of a vapor generator;
- (b) fastening said parts together (Fig. 6, Specification p. 15, lines 5-6) to form a superheated vapor generator defining a vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22), with at least one input (Ref. No. 106, Fig. 2, Specification p. 6, lines 8-9) thereto, said superheated vapor generator having capability for substantially instantaneous vaporization of liquid upon entry thereof into said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22);
- (c) providing liquid supply means (Fig. 6, Specification p. 15, lines 6-8) (Ref. No. 40, Fig. 1, Specification p. 4, lines 23-23) connectible to said input of said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) for supplying liquid thereto; and;

- (d) providing adjustable control means(Fig. 7, specification p. 15, lines 10-11) (Ref. No. 41, Fig. 1, Specification p. 4-5, lines 23-26, lines 1-3 for adjustably controlling ongoing input of liquid into said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) during said ongoing input of liquid, adjustment of liquid input by said adjustable control means (Ref. No. 41, Fig. 1, Specification p. 4-5, lines 23-26, lines 1-3 being substantially simultaneously reflected in adjustment of output of superheated vapor thereby providing the capability of highly precisely adjustably controlling output of superheated vapor from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22) without requiring said system to cease operation.

Claim 22. (Under final rejection and appeal). The method as set forth in Claim 21 further including the step of providing control means (Ref. No. 62, Fig. 1, Specification p.5, lines 13-16) at the output of said vapor generator.

Claim 23. (Under final rejection and appeal). The method as set forth in Claim 21 further including the step of defining at least one groove in at least a portion of an inner surface of at least one of said ports (Ref. No. 52, Fig. 4, Specification p. 5, lines 7-10).

Claim 24. (Under final rejection and appeal). The invention as set forth in Claim 21 further including the step of defining a plurality of grooves in at least a portion of an inner surface of at least one of said ports, such that said grooves vary in depth substantially randomly in height and depth in the range of .030 inch to .050 inch.

Claim 25. (Under final rejection and appeal). The invention as set forth in Claim 22 wherein said output control means (Ref. No. 62, Fig. 1, Specification p. 5, lines 13-16) are adjustable to control the direction of superheated vapor from said vaporization chamber (Ref. No. 126, Fig. 4, Specification p. 6, lines 21-22).

Claim 26. (Under final rejection and appeal). This claim involves a method for cleaning selected objects (Fig. 7, Specification p. 11, lines 11-17) comprising the steps of:

- (a) generating superheated vapor by substantially simultaneously vaporizing liquid into superheated vapor (Fig. 7, Specification p. 12, lines 20-24) through subjecting said liquid to superheating; and
- (b) providing capability of adjustably controlling volume, pressure or velocity on line (Fig. 7, Specification p. 11, lines 10-13) of output superheated vapor for a selected object to be cleaned by adjustably controlling in an ongoing manner volume, pressure or velocity of said liquid upon being subjected to said superheating, wherein said output is substantially instantaneously adjustable upon adjustment of said input thereby providing highly precise control of output of superheated vapor.

Claim 27. (Under final rejection and appeal). This claim involves a method for propulsion (Fig. 7, specification p. 14, lines 8-10) comprising the steps of:

- (b) generating superheated vapor (Fig. 7, Specification p. 12, lines 20-24) by substantially instantaneously vaporizing liquid into superheated vapor through subjecting said liquid to superheating; and
- (c) providing the capability of highly precise control (Fig. 7, Specification p. 15, lines 10-13) of output of superheated vapor substantially continuously to provide propulsion, by adjustable control of volume, pressure or velocity of said liquid, upon being subjected to said superheating, adjustment of said adjustable control being substantially simultaneously reflected in said output of superheated vapor.

Grounds of Rejection to be Reviewed on Appeal.

(1) Whether Claims 1-8 and 11-27 are unpatentable under 35 USC 103(a) over Friedheim '556 (U.S. Pat. No. 5,471,556) or Friedheim '037 (U.S. Pat. No. 4,414,037) in view of Hutchinson (U.S. Pat. No. 6,393,212) and further in view of O'Connor (U.S. Pat. No. 2,779,375),

(2) Whether Claims 9 and 10 are unpatentable under 35 USC 103 (a) over Friedheim '556 (U.S. Pat. No. 5,471,556) or Friedheim '037 (U.S. Pat. No. 4,414,037), in view of Hutchinson and further in view of Berthoud (U.S. Pat. No. 3,863,841)

ARGUMENT.

A. REJECTION OF CLAIMS 1-8, AND 11-27, UNDER 35 USC 103 (A) OVER FRIEDHEIM '556 (U.S. PAT. NO. 5,471,556) OR FRIEDHEIM '037 (U.S. PAT. NO. 4,414,037) IN VIEW OF HUTCHINSON (U.S. PAT. NO. 6,393,212).

Rejection of amended claims 1-8, and 11-27, for alleged obviousness under 35 USC sec. 103(a) is legally and factually erroneous and should be reconsidered and reversed on this appeal.

In formulating a rejection under 35 USC Sec. 103(a) based on a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. Memorandum to the Patent Examining Corps, responding to the KSR decision, Margaret A. Focarino, Deputy Commissioner for Patent Operations, quoted in Patent, Trademark, and Copyright Journal, vol. 74 #1828, page 380 (July 27, 2007).

"To determine whether there was an apparent reason to combine the known elements in the way a patent claims, it will often be necessary to look to the interrelated teachings of multiple patents; to the effects of demands known to the design community or present in the marketplace; and to the background knowledge possessed by a person having ordinary skill in the art. To facilitate review, this analysis should be made explicit." KSR Int'l. Co. v. Teleflex, Inc., #04-1350 (550 US ____); 127 S. Ct. 1727 (April 30, 2007), 82 USPQ 2d 1385 (74 PTCJ 5,5/4/07), at 14.

"First there must be some suggestion or motivation... to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations." MPEP Sec. 2142.

In KSR, the Supreme Court cited with approval the Graham v. John Deere standard for making an obviousness determination whereby "secondary considerations such as commercial success, long felt but unsolved needs, failure of others, etc. might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." KSR at 2. Under the foregoing governing authorities, the Office Action clearly failed to discharge the PTO's burden of identifying the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. Further, the Final Rejection Office

Action and advisory action failed to take account of the "secondary considerations" which provide evidence of patentability as shown hereinbelow.

As demonstrated in the prosecution before the examiner and hereinbelow, the PTO has failed by all criteria set forth above to discharge its burden of proof of unpatentability.

Rejection of claims 1-8 and 11-27 for alleged obviousness under 35 usc 103 is erroneous and should be reconsidered and withdrawn.

The recent controlling authority from the United States Supreme Court entitled *KSR International v. Teleflex Inc.*, 550 U.S. 1, No. 04-1350, 127 S. Ct. 1727, U.S.P.Q.2D 1385 (2007), squarely applies to render the obviousness rejection untenable. Specifically, the Court stated

“[t]he court relied [in the Adams Case] upon the corollary principle that when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious...the fact that the elements worked together in an unexpected and fruitful manner supported the conclusion that Adams’s design was not obvious.” *KSR* at 12.

The description of the Hutchinson reference (U.S. 6,393,212) relied upon in the Office Action as support for the determination of obviousness, is in fact a misdescription, the Hutchinson reference actually being one which teaches away from the invention of the patent as claimed in the subject claims 1-8 and 11-27.

As stated at page 3 of the 12/13/2007 pf the 12/13/2007 Office Action: “Hutchinson discloses a vapor generator having a vaporization chamber, the input port, the adjustable control means such as the control means (22) connected to the pump (20) for controlling the input liquid into the vaporization chamber to further control the pressure and volume of the output steam.” Office Action, p. 3.

Contrary to the position taken in the Office Action as exemplified by the preceding quotation, control of pressure and volume of output in Hutchinson is primarily accomplished by output variable pressure regulating control valve 48. Hutchinson, Col. 6, lines 59, 60. Also contrary to the position taken in the Office Action, Hutchinson explains the true function of elements 20 and 22 as follows: ”A centrally locating [sic] heating body 15 (Fig. 4) receives power input at 18 from a heater control 20 controlled by electronic control system 22. Fluid is supplied to inlet 12

from supply tube 24 connected to reservoir 26 or other source of fluid. Fluid is pumped via tube 24 from tank 26 by a low volume pulse pump 30 through check valves 32 and 34.

“Electronic control system 22 monitors the temperature and pressure in steam generating cylinder 10, and also the level of water in the water tank 26. Pulse type piston pump 30 provides low flow capacity and pressure required to inject feed water into the input 12 against the steam generating cylinder 10 internal pressure as regulated by output variable pressure regulating control valve 48.” Hutchinson, Col. 6, lines 28-37; 54-60. (Emphasis added).

In striking contrast, Applicant’s invention employs controlled fluid input, not controlled temperature or heat content, and as a result, Applicant’s invention has the extremely desirable operating characteristic of capability of rapid variation of output of superheated vapor under precise and responsive control. Thus Hutchinson, with its slow passage of steam through baffles, output control of pressure and volume, and control of temperature and heat, teaches away from Applicant’s invention, involving only input fluid control and very rapid response thereto at the output and does not show, suggest, or disclose Applicant’s novel and unobvious control system and combination. *KSR* at 12.

Further error is contained in Section 7 of the Office Action wherein the comment is made “It would have been obvious to modify the Friedheim devices in view of the Hutchinson teaching of controlling the output by controlling its input.” This is error along the same lines as discussed above. Of course it is a truism that there must be some relationship between input and output; however, control of the output in Hutchinson is through output control 48, a valve, and (apparently) control of heat (not fluid input) and temperature of the superheated vaporization chamber. It is also a truism that if the inlet pump 30 controlled output in the same complete and substantially instantaneous manner as in the instant invention, there would be no need for Hutchinson’s output control 48.

The “flash boiler” aspect of the present invention makes it feasible to employ input control for the purpose of controlling output of superheated vapor. Clearly, as described in the specification, a variation in the flow of liquid into the vaporization chamber will result in substantially completely extremely rapidly vaporized superheated vapor, and will vary the output, since the vapor upon its creation from the input liquid is almost immediately available for issuance at output. The substantially greater speed with which the instant invention works vs. the

Hutchinson device allows for the control of output via the control of input; since the Hutchinson device is relatively slow and operates at a relatively low temperature, this would not be the case for the Hutchinson device.

Applicant's Second Declaration filed 6/28/2006 (including all material in his 03/09/06-filed Declaration) clearly establishes that Applicant's system providing substantially instantaneous vaporization affords adjustable control of output of superheated vapor by adjustably controlling input of liquid for superheating during operation of the system (i.e., on line, continuously) as opposed to the absence of such ongoing adjustable control in the references including U.S. Patents Nos. 4,414,037 and 5,471,556.

In the references cited, Friedheim Nos. 4, 414, 037 and 5,471,556, input of liquid to the vaporization chamber is wholly pre-set as to volume, flow rate and pressure. Input of liquid is provided by a motorized pump operating with pre-determined parameters - -i.e., a pre-determined flow rate (4.9 gallons per hour in an embodiment described in the '037 Patent). '037 Patent col. 5, lines 25-41, col. 6, lines 13-19. The motor is set to operate at 366 rpm and with the particular dimensions described in the '037 patent (col. 5, lines 30-37) to pump at the rate of 4.9 gallons/hour.

As stated in the Second Declaration of Max Friedheim:

"In order to change the preset operating parameters of the '037 system it is necessary either to use a different pump with different operating specifications or to open the pump housing and attempt to tinker with the pump to change its operating performance. Both of these procedures are time-consuming and inefficient and, most importantly, require the pump to be taken offline, thus halting operation of the entire system." Second Decl. of Max Friedheim, para. (5).

By contrast to the cumbersome procedures referred to above regarding changing liquid input to the '037 system vaporization chamber, in the instant system adjustment of ongoing liquid input is accomplished during ongoing liquid input to the vaporization chamber.

As further stated in the Second Declaration of Max Friedheim: "This [capability for ongoing adjustably controllable input] is an important advance because it enables the system to be employed flexibly for varied purposes corresponding to particular required outputs by

merely suitably adjusting the liquid input by means of valve 41 and valve control 43. Such input can be varied not only in volume but in pressure and velocity depending upon the pressure and velocity of liquid as regulated by the valve and valve control. This capability of input control provides output control of pressure, volume and velocity. This in turn permits the system to be efficiently employed for many and varied applications. For example, conventional cleaning of firearms, jewelry and the like and sterilization of surfaces may be accomplished employing the parameters described in the '037 patent. By adjusting downward (i.e., providing smaller fluid input) the same system can be employed to clean and/or disinfect small or fragile parts and components such as medical canulas, needles, and the like, without taking the pump and/or system offline.

“In this manner, the present system provides the capability of continuous use and adjustment for different tasks or within the same task as, for example, to increase output pressure when less accessible portions of the object of the output must be reached.” Second Declaration of Max Friedheim, paras. 6, 7.

KSR also squarely applies to this case with regard to its reaffirmation of the significance of the so-called “secondary considerations” of non-obviousness, among which is long-felt but unfulfilled need. *KSR* at 14.

Also erroneous is the contention in the 12/13/2007 Office Action that the first Declaration of Terry Munson left it “Unclear if the Declaration supports how this input/output was a long-felt need that was unsolved, thus this declaration does not seem to sufficiently provide an evidence [sic] to support the long-felt unsolved need.”

In the 04/24/2008 Amendment after Final, Applicant traversed the aforesaid comments concerning the first Munson Declaration. Out of an abundance of caution, however, Applicant submitted therewith the Supplemental Declaration of Terry Munson in Support of Patentability of Patent Application. The Supplemental Declaration gives a specific example of the vital importance of, and the filling of an unfulfilled need, of the invention of the Patent Application as embodied in Applicant’s Model 6609 apparatus.

As specified in Supplemental Munson Declaration paragraphs 6- 13, Applicant’s Model 6609 embodying the invention of the Application is used for testing circuit boards having a number of

specific sites with soldered connections having differing characteristics of size, location on the circuit board, amount and type of solder, among other parameters, involving subjecting selected sites to bursts of superheated steam having precisely controlled parameters such as velocity, pressure and duration. Supplemental Munson Decl, para. 6.

As stated in para. 8 of the Supplemental Munson Declaration,

“upon subjecting the target soldered sites to bursts of superheated steam, debris results therefrom in the form of particles of flux and contaminants, among others. The debris is captured as the steam cools and condenses and goes into a container of solution. The solution is then tested for contaminants against a standard solution obtained in the above-stated manner from a standard circuit board known to be free of defects.”

Mr. Munson goes on to describe the means by which the above-stated process is achieved and the requirements thereof which can be met only by the invention of the subject Patent Application embodied in Applicant’s Model 6609.

“In the above-described process, precise and rapidly variable bursts of superheated steam are required. Testing cycles will be in a predetermined sequence with predetermined bursts of superheated steam, controlled very precisely as to duration, velocity, pressure, and direction. For example, in a typical cycle, the nozzle out of which emanates superheated steam, will be moved rapidly toward (or directed toward) a particular selected soldered site (designated for specificity ‘Site A’) requiring a burst of superheated steam at selected velocity, pressure and duration, calling for a precisely defined input of liquid (designated, say, ‘Input No.1’). Once the burst of superheated steam is delivered from the output to Site A, the nozzle immediately moves toward (or is directed toward) the next selected site (designated for specificity as ‘Site B’), whose required exposure to superheated steam has or may have different parameters of pressure, velocity, and duration from those for site , and calling for a precisely defined input of liquid (designated for specificity as ‘Input No.2’).” Supplemental Munson Decl. para. (9). (Emphasis added).

The Declarant goes on to explain that the above-stated procedure is repeated for all selected sites according to a predetermined protocol/sequence of inputs and directions of superheated steam flow, and further explains:

“To be feasible, technically and economically, this process requires that there be the capability for rapid directing/deployment of the nozzle from one selected soldered site to the next. This process would be totally unfeasible and impractical if we were to employ Mr. Friedheim’s superheated vapor generator with a preset, metered liquid input. Such a procedure would require using a number of differently directed nozzles, each with different metering of liquid input, obviously a cumbersome and unwieldy process or adjusting/changing the metering for each successive selected site—also obviously a hopelessly cumbersome and time consuming procedure. Both alternatives described

above involving metered input are clearly untenable from the practical point of view.”
Supplemental Munson Decl, para. 10. (Emphasis added).

As further explained by the Declarant, the above-described process is usable for cleaning as well as testing in the same manner as described. Also, the Declarant explains, the process is applicable to cleaning generally, not merely to circuit boards.

“The process using Mr. Friedheim’s technology is uniquely adapted to cleaning and testing of objects having cleaning sites with different characteristics of fragility, size, composition and the like.” Supplemental Munson Decl paras. 11-12.

At para. 13, the Declarant explains the importance and uniqueness of Applicant’s invention:

“For many years, there has been a felt but unfulfilled need in my field of surface cleaning and testing for cleaning/testing devices which can rapidly deploy and rapidly adapt to different cleaning/testing requirements such as the presence of small and delicate parts on the same platform with large and sturdy parts. Mr. Friedheim’s device known as the Model 6609, which embodies the technology of the subject patent application, alone fills this need.”(Emphasis added).

The foregoing constitutes irrefutable evidence of the *KSR* - reaffirmed long-felt but unfulfilled need criterion of nonobviousness. *KSR* at 14.

The Examiner, however, in his advisory action wholly ignored the above-stated criterion of nonobviousness. Rather, he contented himself with repeating prior positions regarding the alleged obviousness of the combination of Huchinson and Friedheim ‘556 or Friedheim ‘037:

“Request for reconsideration has been considered, but does not place the application in condition for allowance because the Applicants’ arguments and the affidavit by Mr. Munson are not deemed persuasive to place the conditions [sic.] for allowance. Particularly, with regard to Huchinson, it is noted that Huchinson also discloses producing superheated vapor as does the applicant, Huchinson further shows control means connected to a water-supplying pump to control the liquid input which results in the output adjustment of the superheated vapor. Furthermore, it is noted that both the prior art Friedheim ‘556 and ‘037 show the pump for providing a volume of liquid, and to one of ordinary [sic] skill in the art, it would have been obvious to adjust the pump and its liquid input to yield an adjusted amount of output as is known in the art such [sic] Huchinson. Advisory Action, page 3.

Applicant’s arguments regarding the pump 30 output control 48 of Huchinson are stated above and were repeatedly made to the Examiner. The important point regarding the advisory action is that it does not respond in any manner as required by the *KSR* case and by the governing

memorandum to the Patent Examining Corps from Deputy Commissioner Margaret A. Foccarino.

It should also be noted that the supplemental declaration of Mr. Munson was submitted in response to the contention in the 12/13/2007 Office Action (cited above) that it is :

“unclear if the Declaration supports how this input/output was a long-felt need that was unsolved, thus this declaration does not seem to sufficiently provide an evidence [sic] to support the long felt but unsolved need.”

The Examiner, however, when such evidence was in fact provided to support the long-felt unsolved need, ignored it as stated in the advisory action.

Accordingly, it is apparent that the Examiner has failed to make the showing of unpatentability that is the burden placed upon the PTO. And accordingly, claims 1-8 and 11-27 have been erroneously rejected, which rejection should be reconsidered and vacated on appeal so that all of these claims will be allowed.

B. REJECTION OF CLAIMS 9 AND 10 AS UNPATENTABLE UNDER 35 USC 103(A) OVER FRIEDHEIM '556 (U.S. PAT. NO. 5,471,556) or FRIEDHEIM '037 (US PAT. NO. 4,414,037) IN VIEW OF HUCHINSON (U.S. PAT. NO. 6,393,212) AND FURTHER IN VIEW OF BERTHOUD (U.S. PAT. NO. 3,863,841)

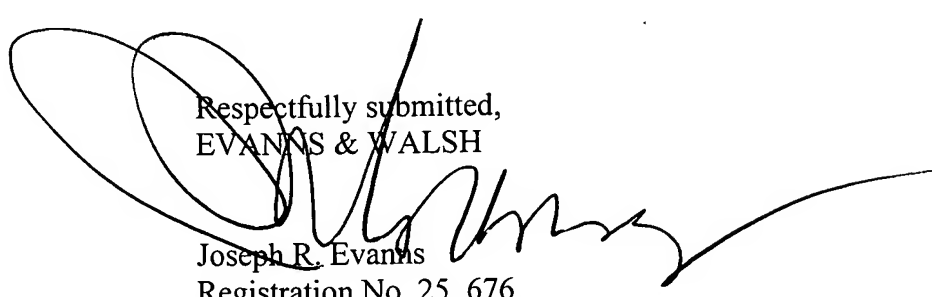
The Berthoud reference is inapposite and inapplicable on similar grounds as discussed above in connection with the Hutchinson reference. As demonstrated above, Claims 1-8 and 11-27 are patentable over the cited references and consequently Claims 9, 10 dependent from Claim 1 are themselves patentable.

The Berthoud reference adds nothing to the analysis of patentability, involving as it does, spray nozzles and control thereof for control of liquid at output for large volume and area spraying such as fields. As noted above, in the instant invention, output volume is controlled at the input by control of input liquid for vaporization.

Accordingly, the rejection of Claims 9 and 10 is erroneous, and should be reconsidered and withdrawn.

C. CONCLUSION

On the basis that the foregoing, it is respectfully submitted that the final rejection herein should be reconsidered and vacated, and that all claims should be allowed.



Respectfully submitted,
EVANNS & WALSH

Dated: 11/13/2008

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EVIDENCE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

MAX FRIEDHEIM

Filed: 4/30/2001

Serial No.: 10/066,281

FOR: IMPROVED SUPERHEATED
VAPOR GENERATOR SYSTEM AND
METHOD

I certify that this correspondence is being
deposited with the U.S. Postal Service as first class
mail in an envelope addressed to: Hon. Commissioner of
Patents
P.O. Box 1450
Alexandria, VA 22313-1450

[Signature]

**SECOND DECLARATION OF MAX
FRIEDHEIM IN SUPPORT OF
PATENTABILITY OF APPLICATION**

MAX FRIEDHEIM hereby declares under penalty of perjury as follows.

- (1) My name is MAX FRIEDHEIM. My address is 2036 Emerald Street, San Diego, California 91950. I am the inventor and applicant in the subject patent application. I make this Declaration upon personal knowledge and have first-hand familiarity with the contents of this Declaration.

If called as a witness I could and would competently and truthfully testify in accordance with this Declaration.

- (2) For many years I have worked and invented in the field of superheated vapor generators and in particular superheated vapor generators comprising vaporization chambers with highly heated walls of specific characteristics such that liquid entering the vaporization chamber is substantially simultaneously vaporized, into a relatively

"dry" vapor (i.e., substantially all of the liquid being vaporized, as opposed to an appreciable amount of vaporized liquid included in superheated vapor). The superheated vapor is outputted from the generator and is employed for various purposes such as cleaning, disinfection and the like. Among my U.S. patents in the superheated vaporization field are U.S. Patent No. 4,414,037, and U.S. Patent No. 5,471,556, incorporated by reference in the subject patent application.

- (3) Many years of testing and use of superheated vapor generators built in accordance with my patents have established that liquid entering into a vaporization chamber of my design substantially simultaneously is vaporized and issued as superheated vapor from the output of the vaporization chamber.
- (4) The within patent application utilizes this capability of my vaporization chamber in connection with control of the output by controlling the input. The control of output is accomplished by control of pressure, volume and velocity of the input liquid through apparatus for controlling pressure, volume and velocity of input liquid flow.
- (5) The improved superheated vapor generator system and method described and claimed in the within patent application is a substantial advance over the system in the '037 patent and the '556 patent. In the prior patents input of liquid to the vaporization chamber is wholly pre-set as to volume, flow rate and pressure in that: said input of liquid is provided by a motorized pump designed to operate with predetermined parameters - - i.e., a predetermined flow rate (4.9 gallons per hour in the embodiment described in detail in the '037 patent.) See '037 patent col. 5, lines 25-41 and col. 6, lines 13-19. The motor is set to operate at 366 rpm and with the particular dimensions described in the '037 patent (col. 5, lines 30-37) to pump at the rate 4.9 gallons per hour. In order to change the preset

operating parameters of the '037 system i.e., to change the input of liquid provided by the pump, it is necessary either to use a different pump with different operating specifications or to open the pump housing and attempt to tinker with the pump to change its operating performance. Both of these procedures are time consuming and inefficient and, most importantly, require the pump to be taken off line, thus halting operation of the entire system.

- (6) By contrast, in the present invention, adjustment of liquid input is accomplished on line by simply adjusting the valve 41 through valve control 43 thereby adjusting input of liquid to the pump and into the vaporization chamber. This is an important advance because it enables the system to be employed flexibly for varied purposes corresponding to particular required outputs by merely suitably adjusting the liquid input by means of valve 41 and valve control 43. Such input can be varied not only in volume but in pressure and velocity depending upon the pressure and velocity of liquid as regulated by the valve and valve control. This capability of input control provides output control of pressure, volume and velocity. This in turn permits the system to be efficiently employed for many and varied applications. For example, conventional cleaning of firearms, jewelry and the like and sterilization of surfaces may be accomplished employing the parameters described in the '037 patent. By adjusting downward (i.e., providing smaller fluid input) the same system can be employed to clean and/or disinfect small or fragile parts and components such as medical canulas, needles, and the like, without taking the pump and/or system offline.
- (7) In this manner, the present system provides the capability of continuous use and adjustment for different tasks or within the same task as, for example, to increase output pressure when less accessible portions of the object of the output must be reached.

I hereby declare under penalty of perjury under the law of the State of California that the foregoing is true and correct.

Executed under penalty of perjury this 24 day of April 2006 at San Diego, California.

Max Friedheim
MAX FRIEDHEIM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

MAX FRIEDHEIM

Filed: 4/30/2001

Serial No.: 10/066,281

**FOR: IMPROVED SUPERHEATED VAPOR
GENERATOR SYSTEM AND METHOD**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Group Art Unit: 3742

EXAMINER: S. Y. PAIK

**SUPPLEMENTAL DECLARATION OF
TERRY MUNSON IN SUPPORT OF
PATENTABILITY OF PATENT
APPLICATION**

TERRY MUNSON hereby declares under penalty of perjury, as follows:

(1) My name is Terry Munson. I am president and founder of Foresight Failure Analysis Inc., Kokomo, Indiana. I make this supplemental declaration in support of patentability of the subject United States Patent Application of Mr. Max Friedheim. I make this supplemental declaration on personal knowledge and have first-hand familiarity with the contents of this supplemental declaration. If called as a witness, I could and would testify in accordance with this supplemental declaration, under oath. I have more than 20 years of experience in the field of prediction of and elimination of failure of particular systems and parts, and specifically, failure due to surface conditions of such systems and parts. I have been employed in the medical field, in the United States Air Force and in the private sector on the above stated subject matter as well as a television news commentator in that field.

(2) As stated in my prior declaration, one of the important activities of my company involves applied surface analysis including testing used in connection with electronic equipment; another important activity of my company is the use of applied surface analysis in connection with pharmaceutical/biological products.

(3) As further stated in my prior declaration, my company's activities involve the diagnosis of and prediction of failures due to surface conditions as well as providing means and procedures for eliminating such sources of failure. Among the particular projects with which my company is involved are diagnosing and eliminating causes of failure in circuitboards and electronic hardware; plastic housing, special implants (such as titanium devices), and small, soldered areas. I am the inventor on U.S. Pat. No. 5,783,938 which is a standard in my field.

(4) Also as stated in my prior declaration, my company has been a customer for the superheated vapor cleaning equipment manufactured and sold by Mr. Max Friedheim, for a number of years. We have used and are using the equipment to clean conventional electronic equipment and other devices and to test for impurities in such equipment and devices.

(5) We are currently employing Mr. Friedheim's product model 6609 with output control on the input side (referred to in my prior declaration, para. 5) in connection with testing equipment, including circuit boards, for defects/impurities resulting from, among other other factors, improper manufacture, storage and/or transportation.

(6) The testing procedure employing Mr. Friedheim's Model 6609 as a vital element is as follows for, as a specific example, testing a circuit board having a number of specific sites with soldered connections having different characteristics of size, location on the circuit board, amount and type of solder, among other parameters; this involves subjecting selected sites to bursts of superheated steam having precisely controlled parameters such as velocity, pressure, and duration.

(7) In the solder testing referred to in para. No. (6) above, the protocol is to subject selected soldered regions/sites of the subject circuit board to precisely controlled (temperature, pressure, velocity, duration) bursts of superheated steam employing Mr. Friedheim's subject technology. In this procedure, the characteristics of the selected target soldered sites vary in terms of location, accessibility, structure, nature of the connection, type and amount of solder, among other parameters.

(8) Upon subjecting the target soldered sites to bursts of superheated steam, debris results therefrom in the form of particles of flux and contaminants, among others. The debris is captured as the steam cools and condenses and goes into a container of solution. The solution is then tested for contaminants against a standard solution obtained in the above-stated manner from a standard circuit board known to be free of defects.

(9) In the above-described process, precise and rapidly variable bursts of superheated steam are required. Testing cycles will be in a predetermined sequence with predetermined bursts of superheated steam controlled very precisely as to duration, velocity, pressure, and direction. For example, in a typical cycle, the nozzle out of which emanates superheated steam will be moved rapidly toward (or directed toward) a particular selected soldered site (designated for specificity as "Site A") requiring a burst of superheated steam at selected velocity, pressure, and duration calling for a precisely defined input of liquid (designated, say, "Input No. 1"). Once the burst of superheated steam is delivered from the output to Site A the nozzle immediately moves toward (or is directed toward) the next selected site (designated for specificity as "Site B"), whose required exposure to superheated steam has or may have different parameters of pressure, velocity, and duration, from those for Site A, and calling for a precisely defined input of liquid (designated for specificity as "Input No. 2").

(10) The above-described process is repeated for all selected sites according to the predetermined protocol/sequence of inputs and directions of superheated steam flow. To be feasible technically and economically, this process requires that there be the capability for rapid directing/deployment of the nozzle from one selected soldered site to the next. This process would be totally unfeasible and

impractical if we were to employ Mr. Friedheim's prior superheated vapor generator with a preset, metered liquid input. Such a procedure would require using a number of differently directed nozzles each with different metering of liquid input, obviously a cumbersome and unwieldy process or adjusting/changing the metering for each successive selected site— also obviously a hopelessly cumbersome and time-consuming procedure. Both alternatives described above involving metered input are clearly untenable from the practical point of view.

(11) The foregoing-described process is usable for cleaning as well as testing in the same manner as described above.

(12) Also, the above-described process applies to cleaning generally not merely to circuit boards. The process using Mr. Friedheim's technology is uniquely adapted to cleaning and testing of objects having cleaning sites with differing characteristics of fragility, size, composition and the like.

(13) For many years there has been a felt but unfulfilled need in my field of surface cleaning and testing for cleaning/testing devices which can rapidly deploy and rapidly adapt to different cleaning/testing requirements, such as the presence of small and delicate parts on the same platform with large and sturdy parts. Mr. Friedheim's device known as the Model 6609, which embodies the technology of the subject patent application, alone fills this need.

I hereby declare under penalty of perjury under the laws of the State of Indiana, that the foregoing is true and correct.

Executed this 4 day of February, 2008 at Kokomo, Indiana.


TERRY MUNSON

APPENDIX
OF
CLAIMS

Claim 1. (Under Final Rejection and Appeal). An improved vapor generator and control system comprising:

- (1) a vaporization chamber for generating superheated vapor substantially instantaneously from liquid upon its entry therein, said vaporization chamber defining at least one input for input therethrough of liquid for vaporization in said vaporization chamber;
- (2) liquid supply means connectible to said vaporization chamber for supplying liquid thereto through said input; and
- (3) adjustable control means for adjustably controlling ongoing input of liquid from said liquid supply means during ongoing input of said liquid from said liquid supply means into said vaporization chamber, adjustment of liquid input by said adjustable control means being substantially simultaneously reflected in adjustment of output of superheated vapor, whereby output of superheated vapor is highly precisely adjustably controllable while said system is in operation.

Claim 2. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said adjustable control means adjustably controls volume of liquid input into said vaporization chamber and thereby adjustably controls volume of output of superheated vapor from said vaporization chamber.

Claim 3. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 further including at least one output port for output therethrough of superheated vapor from said vaporization chamber, said at least one output port including means connectable to output control means for controlling output from said vaporization chamber.

Claim 4. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said adjustable control means for adjustably controlling input of liquid into said vaporization chamber adjustably controls pressure of liquid input into said vaporization chamber and thereby adjustably controls pressure of output from said vaporization chamber.

- Claim 5. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means controls volume of output from said vaporization chamber.
- Claim 6. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means comprises at least one valve member.
- Claim 7. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means includes means for directing in a selected direction superheated vapor from said vaporization chamber.
- Claim 8. (Under Final Rejection and Appeal). The invention as set forth in Claim 7 wherein said output control means comprises at least one valve member.
- Claim 9. (Under Final Rejection and Appeal). The invention as set forth in Claim 7 wherein said output control means is adjustable for directing superheated vapor from said vaporizing chamber in a plurality of selected directions.
- Claim 10. (Under Final Rejection and Appeal). The invention as set forth in Claim 8 wherein said at least one valve member comprises a plurality of valve members at least two of which are adjustable to direct output superheated vapor in substantially perpendicular directions.
- Claim 11. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output port is connectable to at least one object to which superheated vapor is to be directed.
- Claim 12. (Under Final Rejection and Appeal). The invention as set forth in Claim 3 wherein said output control means is connectable to at least one object to which superheated vapor is to be directed.
- Claim 13. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which is rough.

Claim 14. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which defines at least one groove.

Claim 15. (Under Final Rejection and Appeal). The invention as set forth in Claim 14 further including at least one groove other than the first-mentioned groove and wherein said first-mentioned groove and said second-mentioned groove intersect.

Claim 16. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which defines a plurality of grooves.

Claim 17. (Under Final Rejection and Appeal). The invention as set forth in Claim 16 wherein said plurality of grooves vary substantially randomly in depth in a range substantially .030 inch to .050 inch.

Claim 18. (Under Final Rejection and Appeal). The invention as set forth in Claim 4 wherein said output control means is configured to be hand-held by an operator and to be controlled by said operator.

Claim 19. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which includes at least one perforation.

Claim 20. (Under Final Rejection and Appeal). The invention as set forth in Claim 1 wherein said vaporization chamber has at least a portion of an inner surface which includes at least one irregularity.

Claim 21. (Under Final Rejection and Appeal). A method of fabricating a superheated vapor generator and control system comprising the steps of:

- (a) providing at least two separate parts of a vapor generator;
- (b) fastening said parts together to form a superheated vapor generator defining a vaporization chamber, with at least one input thereto, said superheated vapor

- generator having capability for substantially instantaneous vaporization of liquid upon entry thereof into said vaporization chamber;
- (c) providing liquid supply means connectible to said input of said vaporization chamber for supplying liquid thereto; and;
 - (d) providing adjustable control means for adjustably controlling ongoing input of liquid into said vaporization chamber during said ongoing input of liquid, adjustment of liquid input by said adjustable control means being substantially simultaneously reflected in adjustment of output of superheated vapor thereby providing the capability of highly precisely adjustably controlling output of superheated vapor from said vaporization chamber without requiring said system to cease operation.

Claim 22. (Under Final Rejection and Appeal). The method as set forth in Claim 21 further including the step of providing control means at the output of said vapor generator.

Claim 23. (Under Final Rejection and Appeal). The method as set forth in Claim 21 further including the step of defining at least one groove in at least a portion of an inner surface of at least one of said ports.

Claim 24. (Under Final Rejection and Appeal). The invention as set forth in Claim 21 further including the step of defining a plurality of grooves in at least a portion of an inner surface of at least one of said ports, such that said grooves vary in depth substantially randomly in height and depth in the range of .030 inch to .050 inch.

Claim 25. (Under Final Rejection and Appeal). The invention as set forth in Claim 22 wherein said output control means are adjustable to control the direction of superheated vapor from said vaporization chamber.

Claim 26. (Under Final Rejection and Appeal). A method for cleaning selected objects comprising the steps of:

- (a) generating superheated vapor by substantially simultaneously vaporizing liquid into superheated vapor through subjecting said liquid to superheating; and
- (b) providing capability of adjustably controlling volume, pressure or velocity on line of output superheated vapor for a selected object to be cleaned by

adjustably controlling in an ongoing manner volume, pressure or velocity of said liquid upon being subjected to said superheating, wherein said output is substantially instantaneously adjustable upon adjustment of said input thereby providing highly precise control of output of superheated vapor.

Claim 27. (Under Final Rejection and Appeal). A method for propulsion comprising the steps of:

- (d) generating superheated vapor by substantially instantaneously vaporizing liquid into superheated vapor through subjecting said liquid to superheating; and providing the capability of highly precise control of output of superheated vapor substantially continuously to provide propulsion, by adjustable control of volume, pressure or velocity of said liquid, upon being subjected to said superheating, adjustment of said adjustable control being substantially simultaneously reflected in said output of superheated vapor.